

Mansfield Hollow Lake
Mansfield Center, Connecticut

FOREST MANAGEMENT PLAN
Master Plan Appendix B
and
FISH AND WILDLIFE MANAGEMENT PLAN
Master Plan Appendix D

Department of the Army
New England Division
Corps of Engineers
Operations Division
Waltham, Massachusetts

August 1982

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL

NEDOD-P

SUBJECT

Master Plan Appendices B & D, Forest and Fish and Wildlife Management, Mansfield Hollow Lake

TO See Distribution

FROM Acting Chief, Operations
Division

DATE 25 January 1983
MITCHELL/1sd/284

CMT 1

1. The subject appendices, prepared in accordance with ER 1130-2-400, dated May 1971, have been approved by the Division Engineer.
2. The plan has been developed to increase the value of reservoir lands for recreation and wildlife, and to promote natural ecological conditions by following accepted conservation practices.
3. This plan has been developed in coordination with the Connecticut Department of Environmental Protection. This plan should be used as an informational copy.

Incl
as

J. C. Wong
J. C. WONG
Acting Chief, Operations Division

Distribution:

- (2) CDR USACE (DAEN-CWO-R)
WASH, DC 20314
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DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is TAGO.

REFERENCE OR OFFICE SYMBOL

SUBJECT

NEDOD-P

Master Plan Appendices B and D, Forest and Fish and Wildlife Management Plan, Mansfield Hollow Lake

TO

Division Engineer

FROM

Acting Chief, Operations Division

DATE

10 December 1982
MITCHELL/lsd/284


CMT 1

1. Inclosed for your approval is the Forest and Fish and Wildlife Management Plan for Mansfield Hollow Lake. This plan will serve as Appendices B and D to the Master Plan for this project.

2. It has been prepared in conjunction with ER 1130-2-400, dated 28 May 1971. It has been reviewed by NED Planning and Real Estate Divisions and the Connecticut Department of Environmental Protection.

3. Division Engineers have been designated as approval authority for these plans by ER 1130-2-400. Information copies are to be forwarded to OCE upon approval.

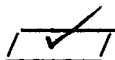
Incl
as



J. C. WONG
Acting Chief, Operations Division

TO Acting Chief, Operations Div FROM Division Engineer DATE

CMT 2



APPROVED



DISAPPROVED



CARL B. SCIPLE
Colonel, Corps of Engineers
Division Engineer

Mansfield Hollow Lake
Mansfield Center, Connecticut

FOREST MANAGEMENT PLAN
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ACKNOWLEDGMENTS

The Corps of Engineers, New England Division, wishes to thank the following people for their effort in developing this natural resource management plan:

Mr. John Clarkin, Park Manager, TRB

Ms. Joan Cyr, Park Ranger, TRB

Ms. Nancy Moore, Park Ranger, TRB

Mr. Charles Freeman, Planning Division

Mr. Russell Keeler, Real Estate Division

Mr. John Mitchell, Operations Division

Ms. Laraine Bogosian, Word Processing

Reprographics Section, Graphics and Reproduction

Also, thanks to the Connecticut Department of Environmental Protection for their contribution to this plan.

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SECTION 1. INTRODUCTION

Purpose

The land and water resources of Mansfield Hollow Lake are valuable environmental assets to the people of the surrounding areas, providing recreational opportunities, and conservation and protection of the resources within the project.

The purpose of this management plan is to identify the forest, fish, and wildlife resources of Mansfield Hollow Lake, and to provide a framework to guide their management.

Authority

This plan constitutes Appendix B (Forest Management Plan) and Appendix D (Fish and Wildlife Management Plan) to the project master plan authorized under ER-1130-2-400 dated May 1971.

Objectives

This management plan will outline proper ecological management practices which are compatible with flood control operations and multiple-use practices at Mansfield Hollow Lake.

Specific Objectives Are To:

- protect and enhance the natural beauty and character of the area.
- develop fish and wildlife habitat which will attract and support the greatest variety of naturally occurring wildlife.
- provide for diversified recreational use of the project's natural resources.
- maintain a healthy, vigorous forest which will provide wood products for project and commercial use.

Coordination

Development of this management plan has been coordinated with the State of Connecticut, Department of Environmental Protection (D.E.P.) who prepared the forest, fish, and wildlife management programs of the plan.

SECTION 2. PROJECT DESCRIPTION

Location

Mansfield Hollow Lake is located in northeastern Connecticut on the Natchaug River in the Thames River Basin. 5.3 miles above the Natchaug's confluence with the Willimantic River, where the two rivers form the Shetucket River. The Natchaug River drains the west central part of the basin and is one of the three principal tributaries of the Shetucket. The Natchaug flows out of western Windham County and into Mansfield Hollow Lake in the towns of Mansfield, in Tolland County, and Windham, in Windham County. The dam is about 4 miles north of the center of Willimantic, 25 miles east of Hartford and 40 miles west of Providence, Rhode Island.

Acquisition

The dam, reservoir and dikes are elements of the flood protection plan for the Thames River Basin which was approved by the Flood Control Act of 18 August 1941 (Public Law 228, 77th Congress, 1st Session). The total area of the project is 2533 acres of which 2472 acres were purchased in fee and 61 acres are held in flowage easement. The project was completed in March 1952.

History

The Village of Mansfield Hollow, Swift's Hollow, or simply "The Hollow," as it has been called since its first settlement, is situated in a small valley. The valley is bounded by Bassett's Bridge Road on the north and Rt. 195 on the west. Other approximate boundaries are the Natchaug River on the south and the present Mansfield Hollow Dam on the east.

Since the early eighteenth century, the Hollow has been characterized by its combination of farms and mills, often owned by the same families. It has, however, remained unmarked by signs of industrialization - wider roads, railroads, a commercial district, or to any great extent, mill housing. This results in the twentieth-century Hollow having much of the appearance and tranquility that it must have had in the nineteenth century. There are still corn fields on the periphery of town, and home gardens around the cluster of residences in its center whose eighteenth, nineteenth and twentieth century designs are homogeneous in their simplicity of line.

The Hollow is located within the bounds of "Joshua's Tract." In 1685 the legatees of Joshua, the third son of the Mohegan chief Uncas, had their inheritance surveyed and divided into forty-eight one thousand acre lots. In 1695 Robert Fenton built a bridge "suitable for man and beast" over the falls in the Natchaug River, probably at the Hollow. The suitability of the river at this point for powering mills was soon recognized and utilized. A mill is first mentioned in a deed of January

1728-29 which refers to "the highway that leads to the gristmill." By 1761 there were in addition to the gristmill a fulling and bolting mill, and in 1794 land by the river was leased on which to build a sawmill. The nineteenth century was the period of commercial production of silk in Mansfield, and the first silk company in the Hollow was organized by 1833. Other thread companies followed. The first buildings, no longer extant, were wood. The present stone mill was constructed in 1882. It has since housed various manufacturing ventures including optical parts and primers for British guns in World War I. The mill in the Hollow has had a succession of colorful and dynamic, though often financially troubled, owners including Fearing Swift, Nathan Rixford, Marcus Monroe Johnson, and George J. Kirby. These men influenced the economy and development of the Hollow and have left their mark, and often their memory in it.

Certainly the most important and dramatic change in this century in the Hollow has been the construction of the high level dam by the U.S. Corps of Engineers in 1952, which has controlled flooding and water shortages in the region. At the same time, the disappearance of roads and bridges has insulated the Hollow from traffic and development. The area around the reservoir has been designated a State park and has become a popular recreation area for residents and visitors. The stone mill is presently owned by the State of Connecticut and is used for general storage. Following a period of economic depression and loss of residents after the Second World War, the last decade has witnessed the active re-settlement and restoration of most of the earlier houses and the renewal of the sense of community and distinctiveness which has so long characterized this area. Recently, Mansfield Hollow has been designated as a State Historic District and placed on the National Register of Historic Places in recognition of the unique preservation of a 19th century rural village.

Climate

The Thames River Basin, including the Natchaug River watershed and Mansfield Hollow Lake, has a variable climate characterized by frequent but short periods of heavy precipitation. The basin lies in the path of the "prevailing westerlies" and cyclonic disturbances that cross the country from the west or southwest to the east or northeast. The basin is also occasionally exposed to coastal storms, some of which originate in the tropics and may be of hurricane intensity, heavily laden with moisture from the ocean.

The southern part of the Thames River Basin has a generally milder climate than the northern part which is due to the influence of the Long Island Sound. The average annual temperature in Mansfield near the dam is about 48°F. Average monthly temperatures range from about 70°F in July and August to 26°F in January and February. Air temperatures sometimes reach 100°F in summer and fall to -10°F or lower infrequently in winter.

The average annual precipitation over the Thames River Basin is about 44 inches. Snowfall at Mansfield Hollow Dam averages about 43 inches, which is about 1-foot less than in northern parts of the basin. For the Thames River Basin as a whole, the average annual runoff is 22.5 inches (1.64 cfs per square mile) or just over 50 percent of the average annual precipitation.

Topography

The Natchaug River is formed by the confluence of the Still River and Bigelow Brook south of Phoenixville, Connecticut, and flows southwestward to Mansfield Hollow Lake. During spring freshets, the river rises moderately, with summer flows well sustained by rainfall and groundwater. Because of the generally hilly topography, runoff is fairly rapid throughout the Thames River basin.

The Natchaug River has a total fall of 267 feet along a total length of 16 miles. In the vicinity of the reservoir, the average slope is about 15 feet per mile. Hilly terrain with moderate relief surrounds the reservoir area. The river valleys are narrow and steep-sided and are flanked by terraces and high hills. Parts of the narrow flood plains are swampy. The upper part of the reservoir inundates a former marsh and swamp. Elevations in the vicinity range from about 190 feet NGVD in the streambed at the dam to about 590 feet NGVD on a hill west of Chaffeeville overlooking the Fenton River.

Geology and Soils

The bedrock underlying the dam and reservoir area is metamorphic gneisses and schists with pegmatite intrusions. Natchaug, Fenton and Mount Hope Rivers flow mostly over alluvium composed of silt, sand, and gravel, although for short distances the Natchaug and Mount Hope rivers flow through narrow valleys of bedrock and through the terraces of glacial drift that line all three steep-sided river valleys. These terraces are the only flat areas above the flood plain and therefore are used in preference to other parts of this predominantly hilly area for most recreation activities.

Land Classification

The project area contains 2472 acres acquired in fee and is open to the public, with 61 acres in flowage easement. The immediate area outside the project contains woodland, residential property, commercial enterprises and a small airport. The reservoir area has been cleared to an elevation 18 feet above the base of the dam or 12 feet above the level of the summer recreation pool, for a total of about 600 acres. The easement properties are located southeast of the dam in the village of North Windham, the southwest corner of Chaplin, and the southeast corner of Mansfield, all consisting of small residential properties.

About 159 acres of land in the immediate vicinity of the dam and dikes are reserved for operational and maintenance purposes by the Corps of Engineers, with accommodations for the visiting public. The balance of the reservoir area (2313 acres) is presently licensed to the State of Connecticut. The principal developed recreation area is located in the flat high area in the midportion of the reservoir. The major public use facilities which are completed and available for use are located along the northwest side of the lake.

The remaining land and water areas licensed to the State are available for fish and wildlife and forestry management where compatible with flood control and other recreational uses of the reservoir area. Included on the area licensed to the Connecticut Department of Environmental Protection, Parks and Recreation Unit are 525 acres which are presently outleased for agricultural purposes to former owners.

Vegetation

About three-fourths of the land in the towns of Mansfield, Chaplin, and Windham is wooded, including about 50 percent of the reservoir area. Most of the woodland varies in density and tree sizes, indicating recent regeneration following some previous use, such as agriculture or logging. The predominant tree species in the floodplain and swamp woodlands are red maple, gray birch, red oak, American elm, and sugar maple. The shrub swamps of the reservoir consist largely of red-osier dogwood, meadowsweet, steplebush, speckled alder and black alder. The herbaceous plants of marshes and wet meadows are tussock sedge and other sedges, grasses, rushes, and ferns. The upland woods in the reservoir area occur mostly on dry sandy soil and consist predominantly of red and white oak and white pine.

Water Quality

The waters of the Natchaug, Mt. Hope and Fenton Rivers which flow into the reservoir are classified by the State of Connecticut as AA water which is of uniformly excellent character and is suitable for water supply and all other water use. Because the water supply reservoir for the city of Willimantic is located one mile downstream from Mansfield Hollow Dam, regulations of the State Department of Public Health prohibit swimming, bathing or any other water contact activities in the project area.

SECTION 3. FOREST MANAGEMENT

General Description

Mansfield Hollow is owned by the Corps of Engineers and leased to the State of Connecticut, DEP for multiple use management. This area is where the Fenton, Mount Hope, and Natchaug Rivers join. Project bounds were set just above highest possible water level for Mansfield Hollow Dam. Forest management is permitted by the Corps of Engineers only north of Bassett Bridge Road. This section is in the towns of Mansfield (Tolland County) and Chaplin (Windham County).

Total acreage in this part of the reservoir is 1100 with 568 acres forested and an additional 16 that could be reforested which are not used for park recreation. Of the forested, 416 is manageable and 152 is inaccessible. Two hundred acres are in ponds and streams and the remainder is inoperable wetland.

By agreement between the State of Connecticut and the U.S. Army Corps of Engineers, Mansfield Hollow became Connecticut's 71st State Park in 1952. Together, the State and the Federal Government cooperate to develop and manage a variety of outdoor recreational facilities on 2,300 acres.

Resource Features

Forest types are white pine (80ac), softwood-hardwood (53ac), and mixed hardwood (283ac). One-hundred and sixty-seven acres of the mixed hardwood is on poor sites with little to no good growth potential. With the exception of one 18 acre stand, the whole forest would benefit from forest management. Shelterwood cuttings for logs or fuelwood would benefit 234 acres and thinnings would benefit 164 acres.

Most of the forested area is on gravel and sandy soils. Only 116 acres of the manageable forest is on a medium growing site for hardwoods. Best usable gravel deposits are in stands 10, 11 and the area between the town land fill and route 89. Stands 1, 5, 6, 14, 20, and 18 are on gravel or sand deposits (see Exhibit B).

The present woodlands have only recently become forest since the dam was built. These areas consist of hardwoods growing on a pine site.

There is a major recreation area for picnicking and athletics in stand 17. A boat launch is also in this area. A cross country ski trail traverses the lake between Bassett Bridge Road and Route 89. The Connecticut Blue Trail system starts at the picnic area and follows the Fenton River North.

Management Restrictions

There are no critical or unstable soils except those in stand 2 on the Fenton River. This area will have to be worked in late summer or on frozen ground. Wetland soils adjacent to the rivers are not operable and will not be driven over or operated on. There are no set aside natural areas, experimental plots or specific deed restrictions. Mansfield Hollow is leased from the Corps of Engineers for D.E.P. to practice multiple use management.

Any forestry work must support both the water quality and recreational uses of the reservoir. The city of Willimantic uses this water for its water supply. Many recreational trails for all season use exist throughout the area and forestry must not interfere with these uses.

Forest Management

Silvicultural information

The 416 acre forest has 283 acres of mixed hardwood, all in the sawtimber or pole/sawtimber size class. Of this, 136 acres are on site index 54 for oak and should be converted to a softwood-hardwood type. Within this type are 5 stands (163ac) where a timber sale shelterwood harvest is indicated. Another 3 stands (71ac) require a fuelwood shelterwood harvest. A timber thinning is indicated on one 22 acre stand and a fuelwood cull removal on a 27 acre stand. Two of the better mixed hardwood stands have a great deal of sugar maple regeneration and will become a northern hardwood type over time. Volumes range from zero to 5800 board feet per acre with most stands averaging just under 3000. Species are white, black and scarlet oak with hickory and sugar maple in better stands and red maple and white pine in poorer stands. Basal areas average over 80 square feet, but poor tree form and rot are very prevalent.

There are 53 acres of softwood-hardwood in 2 stands. These are sawtimber and pole/sawtimber stands. One is on a poor oak site and the other on a low/medium oak site. Both are overstocked and would benefit from a fuelwood thinning primarily of cull trees. The poorer site has white and pitch pine and white and scarlet oak. The better site consists of hemlock, oaks, red maple and sugar maple. Volume on the poorer site is 5700 board feet per acre. Volume on the better site is 4000 bd. ft. per acre.

The remaining 80 acres of the forest are white pine type in 4 stands. All are sawtimber stands. Three would benefit from a log thinning to reduce crowding and to take out culls. The other stand was cut in the late 60's and is not fully stocked. Associated with the white pine are pitch pine, white oak, scarlet oak and some red maple. Stocking levels or basal area vary from 98 (leave alone) to 168 square feet per acre. Present volumes in the white pine are higher than other stands but

reflect a high percent of culls and small brush openings. Volumes vary from 4,500 to 10,000 board feet per acre.

Only 18 acres of forest trees are presently growing at less than 8 rings per radial inch. Two-hundred-thirty-four acres contain so few potentially acceptable trees that shelterwood cuts to establish a new stand are in order. One-hundred-forty-five acres of this (93 acres to log and 52 to remove fuelwood) must be done during a white pine seed year to have reasonable chance of regenerating white pine. Generally pine seed years occur only an average of one year in four, and because pine has a two year cone development, the stands that must be cut during seed years are listed separately in priority order. All logging will be during the period 1 June - 1 January only, each year. Tops left from logging can be removed for fuelwood over the winter only if deemed a hazard to the flood control operations. Cutting will occur on an average of 40 acres per year over the next 10 years with the most acres cut in any one year being 56.

Cutting schedules follow:

| <u>Year</u> | <u>Group</u> | <u>Stand</u> | <u>Acres</u> | <u>Operation</u> | <u>cds.</u> | <u>Volume</u> <u>Timber MBF</u> |
|-------------|--------------|--------------|--------------|-----------------------|-------------|------------------------------------|
| 1 | | 27 | 7 | sawtimber thinning | 15 | 21 |
| 1 | | 28 | 7 | sawtimber thinning | - | 21 |
| 1 | | 9 | 19 | fuelwood shelterwood | 130 | - |
| 2 | | 16 | 20 | sawtimber thinning | - | 28 |
| 2 | | 5 | 15 | sawtimber shelterwood | 80 | 30 |
| 3 | | 1 | 15 | fuelwood thinning | 120 | - |
| 3 | | 2 | 27 | fuelwood thinning | 180 | - |
| 4 | | 20 | 38 | fuelwood thinning | 200 | - |
| 5 | | 15 | 50 | sawtimber shelterwood | 100 | 135 |

Pine seed year cutting to bump (replace & extend) above years and regenerate existing openings

| | | | | | |
|----------------------|-------|----|-----------------------|-----|------|
| a | 18 | 48 | sawtimber thin | - | 72 |
| b | 6 | 29 | sawtimber shelterwood | 100 | 58 |
| b | 21 | 27 | fuelwood shelterwood | 135 | - |
| c | 11 | 25 | sawtimber shelterwood | - | 37 |
| c | 13&14 | 25 | fuelwood shelterwood | 125 | - |
| d | 19 | 39 | sawtimber shelterwood | - | 50 |
| Totals to be removed | | | | - | 1185 |
| | | | | | 452 |

Administrative time for management plan preparation was ten forester days and one clerical day. Administrative time on timber sales is one day per 10 MBF and on fuelwood sales one day per 40 cords. This includes detailed plans, markings, selling and on-site sale provision. No small uninsured fuelwood sales will be permitted. For all cutting, two copies of plan and contract will go to Corps of Engineers, Mansfield, CT and Waltham, MA.

Protection

State Route 89 and several paved and good gravel town roads provide access to Mansfield Hollow. The DEP and Corps of Engineers gate off seasonal roads into stands 13-14, 6, 17-20, 9-11. These roads should only be used in summer and fall. They will provide occasional access to fire vehicles. No new roads are planned. Boundary around this section of the park is approximately 15 miles. All bounds have been well marked within the past five years.

There are 7 road junctions within the project that cross streams or ponds making water for fire fighting plentiful.

The community fire dispatch center is Willimantic and Mansfield Co. would respond to Mount Hope and Fenton River areas with Chaplin responding to Natchaug River area. Both have ambulances as well. Local State police are represented by the Mansfield Resident Trooper and the Stafford State Police Barracks.

There has been no recent high fire incidence rating in this area. Problems with insects, disease, and weather are few.

Winter flood control operations can shift the lake ice and prevent forest regeneration in low areas. No attempt will be made to plant or establish natural trees in these areas. Any incidence of gypsy moth defoliation during a pine seed year should not harm newly germinating pine but may kill other trees. The shelterwood system will be used for pine regeneration to minimize adverse effects of poor tree form due to the white pine weevil.

Any forest planting will consist of mixed species of pine and larch and may include pitch/loblolly pine and/or hemlock. Spacing will be 15 x 15 (200 per acre). No management techniques other than the above mentioned silvicultural ones are envisioned at this time.

Recreation

Due to the extensive trail system for both hiking and cross country skiing, timber harvesting will occur in June through December only. Trails within harvested areas will be kept open and free of ruts at all times. Signs will be put up where timber harvesting overlaps main trails explaining the operation. The D.E.P. forester will erect any signs. The project manager and forester will share sign maintenance for one year.

Watershed management

If it is necessary to use herbicides to maintain trails or to control ironwood or dogwood, only ammate or krennite will be used.

Goals and Objectives of Forest Management

1. Develop full utilization of the 416 acres with the best possible trees.
2. Maintain a healthy, high vigor forest, able to withstand insects, wind, and disease.
3. Maintain the access system and gates through wood product sales.
4. Increase diversity of vegetation.
5. Grow even-aged white pine in valleys.
6. Grow uneven-aged white pine mixed with 25% other species on ridges that are part of scenic vistas or open to the wind.
7. On hardwood sites develop a stands' potential for ash, sugar maple and tulip-tree and reduce the percent of oak canopy to less than 60% of the crown.

SECTION 4. AQUATIC MANAGEMENT

Existing Management

No fisheries management is currently underway on the lake's fish population. Harvest control is exercised through minimum length limits and daily creel limits for largemouth bass, smallmouth bass and chain pickerel. Daily creel limit is 6 for each species.

The University of Connecticut (Dr. Walter Whitworth) has conducted frequent surveys of the lake's fish population.

Factors Influencing Aquatic Management

Water Quality

Three major streams with minimally developed watersheds enter the lake; all are stocked with brook, brown and rainbow trout annually. Naubesatuck (or Mansfield Hollow) Lake water quality would be characterized as excellent for warmwater fish and marginal for coldwater species because of shallow depth and periodic drawdowns.

Water Level Fluctuation

Seasonal fluctuations in water levels can have either advantageous or deleterious effects upon fish populations. Spring drawdowns may reduce the abundance of forage species such as sunfish and yellow perch as a result of reduced spawning and nursery habitat. Chain pickerel numbers would also decline.

May and June drawdowns can adversely affect largemouth and smallmouth bass population levels for the same reasons.

Fall-winter drawdowns can have a positive impact by concentrating forage species for easier predation by bass and pickerel.

Aquatic Weeds

Fertility of water and substrate, shallow water depths and poor water circulation are factors which lead to aquatic weed problems. Considering the relative sterility and volume of incoming waters to Mansfield Hollow, aquatic vegetation should pose a problem only in sheltered cove areas.

Given the ability to drawdown the lake during the fall and winter each year, aquatic weeds can be substantially reduced in abundance by exposing their substrate to dessication and freezing.

Pesticide Uses

The use of pesticides, other than for forest or wildlife management in blocks not adjacent to the watercourses or the lake, is not recommended.

Access and Fishing Pressure

The existing parking and launch facilities are adequate to handle the present recreational usage. Some thought should be given to modifying the existing dock to improve its stability and capacity. There is potential as well for a small handicapped fishing area, if such an area could be located so as not to interfere with boating traffic.

Endangered Species

No endangered fish species have been identified in the lake.

Aquatic Management Program

Since largemouth bass appear as the lake's preferred sport fish, an emphasis should be placed upon creating structures in the littoral environment that these fish inhabit. Large boulders, fallen trees and sharp drop-offs foster the survival of bass larger than the minimum length limit. Artificial reefs can also be valuable by improving habitat.

An ongoing State project which is studying the largemouth in Connecticut may provide some valuable management information on the species.

Drawdown effects upon bass in Mansfield Hollow could be the basis for an interesting management program utilizing the concept of proportional stock density (PSD)¹ in conjunction with drawdowns.

¹Anderson, Richard O., Missouri Coop. Fish. Res. Unit, U. of Missouri - Proportional Stock Density (PSD) and Relative Wright (Wr) Interpretive indices for Fish Populations and Communities.

SECTION 5. WILDLIFE MANAGEMENT PLAN

Existing Management

Wildlife management at Mansfield Hollow Lake is currently performed by the State of Connecticut, Department of Environmental Protection who lease 2012 acres of the project for multiple use purposes.

State budgetary constraints and labor shortages have not allowed for implementation of extensive wildlife habitat manipulation or developmental work. Wildlife management has consisted of food plantings for upland game birds, and the stocking of pheasants.

Factors Influencing Wildlife Management

Forest Management Effects on Wildlife

Wildlife species in this region are best maintained by maximizing the forest edge through clearing or maintenance of open areas and creation and maintenance of unevenaged forest stands.

Forestry operations lend themselves well to these practices by selective and clear cutting harvest techniques and by the cutting and maintenance of forest access roads. Immediate benefits to wildlife include the utilization of felled tree tops for browse and growth of understory browse in logged areas.

Any forestry operation, especially fuelwood cuttings, should be monitored to prevent excessive loss of den trees.

Hunter Access and Designation of Hunting Areas

Deer hunting is not allowed at Mansfield Hollow Lake. Otherwise, hunting is allowed on all lands of the project except at a wild refuge area located on Bassetts Bridge Road, and in areas located within 500 feet of buildings or developed recreation areas. All hunting activity is subject to State of Connecticut Fish and Game Laws.

Hunting access is generally good throughout the project. Since most hunting is for pheasants which are stocked on a put-and-take basis, the majority of hunting activity occurs around the pheasant stocking site at the field trial area. Development of new stocking sites would diversify hunting activity and eliminate hunter congestion which has occurred at the existing site.

Access and Areas for Wildlife Observation

All project areas are open to wildlife observation and subject to the same access limitations as for fishing and hunting activities.

Mammalian species present include white tail deer, cottontail rabbit, mink, woodchuck, grey and red fox, skunk, opossum, voles, mice, and other rodents. Mammalian species rare in the project are river otter, North American beaver, and muskrat.

Upland game birds include ruffed grouse, ringnecked pheasant, and bobwhite quail. Non-game birds include canada geese, mallard, black duck, wood duck, red-tailed hawk, common loon, herring gull, cattle egret, migrating shorebirds, mockingbird, cardinal, and wintering sparrows and finches.

Reptiles and amphibians include snapping, painted, and spotted turtles, water snake, milk snake, garter snake, hognose snake, and green snake, bullfrog, green frog, and leopard frog, redbacked salamander, and newt.

Effect of Reservoir Operations

The effect of flood storage and spring raising of the pool level may be critical for wildlife management during the breeding season. Summer flood control operation would be less critical. Very young wildlife might be killed, but older wildlife could evade rising flood waters.

Effect of Recreational Use

The public's recreation demand as well as the natural resources of the project are the primary reasons for continuing multiple rather than single purpose use of Mansfield Hollow Lake. Because this land must be left undeveloped for flood storage, it is largely preserved and managed as natural open space in which regulated recreational use is compatible with wildlife management.

Recreational uses include picknicking, team sports, boating, hunting, fishing, and hiking. The project property below Bassett Bridge, where most recreation facilities and activities are now located, has less natural environmental value than other areas of the project which, if left undisturbed for the benefit of forest and wildlife, would maintain the present balance on the project between undeveloped open space and relatively high intensity use recreation areas. This course of management recognizes and responds to the necessity of both.

Detrimental effects of recreational use have resulted from unauthorized off-road vehicular activity which has caused vegetation destruction, slope erosion, and annoyance of wildlife. Control of this problem could best be accomplished by a combination of physical barriers, intensive enforcement efforts, and public education of the environmentally harmful effects of such activities.

Endangered Species

Rare or endangered species generally are associated with rare habitat types or have exacting requirements with respect to a host of environmental factors. The habitat at Mansfield Hollow Lake is not uncommon and no rare or endangered species have been found.

Wildlife Management Program

The most practical method for maintaining or improving wildlife habitat conditions in this area is to incorporate the Wildlife Units Cooperative Agricultural Agreements Program.

This agreement program will allow local farmers to produce and harvest crops on designated parcels of land within the Army Corps' ownership. In return for such land use the appointed farmer will give payment in the form of goods and/or services, which will improve wildlife habitat conditions. The amount and types of goods and services will be determined and agreed to be the District Wildlife Biologist and the appointed farmer on an annual basis. Generally, average area land rental fees are used as the basis for determining the amount of goods or services required from the farmer.

By utilizing the Cooperative Agricultural Agreement Program, desired vegetative diversity can be achieved for the benefit of wildlife and recreational users. The objectives of this program are: (1) Maintain or improve wildlife habitat for all forms of wildlife, (2) provide an aesthetically pleasing environment for wildlife resource users and passive recreationists, (3) provide acreage to farmers for producing crops, and (4) effectively maintain or develop wildlife habitat at feasible monetary costs. (See annual procedure guidelines of agricultural agreement - Appendix 1.)

Wildlife management practices to be incorporated into annual land use planning for agricultural agreements may include one or more of the following:

1. Maintenance of old fields and open areas
2. Strip mowing on border cuts to eliminate competition, retard hardwood succession and increase transition zones of "edge" for wildlife.
3. Brush mowing roadsides, opening every 3 years.
4. Creation of small food plots to provide both food and cover.
5. Leaving portions of crops standing in locations favorable to wildlife.

6. Implement crop rotation schedules.
7. Maximizing "edge effect" when feasible in planning openings or food plots.
8. Soils preparation for supplemental plantings.
9. Creating travel lanes, seeding roadbeds to cover crops.
10. Mowing schedules for haylots to insure minimal disturbance to nesting wildlife; insure adequate cover for small game season and scheduled field trials.

Potential: Wildlife potentials for the Mansfield Hollow Lake Project are: farm wildlife areas, forest wildlife areas, some wetland wildlife areas.

Objectives: The primary objectives are to improve and maintain the area for all forms of wildlife at minimal cost. This will be accomplished by:

- a. Incorporation of field data generated by Army Corps Park Rangers.
- b. Implementation of the Cooperative Agricultural Agreement Program.
- c. Cooperative efforts with Forestry Management, Fisheries Management and Recreation Management disciplines to coordinate multiple use planning.
- d. Use of State and Federal labor force when feasible.
- e. General funding monies when available.

Justification: There seems to be an almost unlimited demand on the part of the citizens of Connecticut, particularly for sportsmen license holders and wildlife oriented recreationists, for quality wildlife areas. This area, at present is one of the few Federally owned lands leased by the State, which has excellent potential in providing quality habitat for most forms of wildlife found in Connecticut. The size of the State and our road network makes this area easily accessible.

Recreational Plans and Benefits: A considerable volume of data on recreational need, plans and planning, statewide and by planning regions is available in the technical reports of the Connecticut Development Commission-Inter-Regional Planning Program and the data files of that office. Number 111 Physical Geography, 124 Water, 153 Transportation, and the Green Land are

particularly important. Even more definitive is the Connecticut Comprehensive Statewide Outdoor Recreation Plan, 1965-1970. Vollmer Associates, and Statewide Comprehensive Outdoor Recreation Plan D.E.P., William Burch and Associates, 1973 and 1978. The values of wildlife and plans presented in these publications are acknowledged . No figures are available on man-days of hunting in Connecticut from which to make projects of future use.

SECTION 6. SPECIAL NEEDS

TRAINING

Cooperation with all resource agencies in the planning and action stages of management will incorporate interagency training and university instruction for field managers.

Multi-disciplinary training will receive high attention but participation in on-site resource management activities will also be stressed. Procedures and standardization of user surveys and State fish and game laws are among many items in which Corps personnel need instruction. As conditions arise, managers are urged to identify other training needs and coordinate programs applicable to their management activities.

RESEARCH COOPERATION

The Corps of Engineers supports university research and studies that attempt to solve current management problems. Mansfield Hollow Lake is open for any activities that will benefit the education of university students, research personnel and environmental programs implemented at the project. The resulting research will lead to better resource management.

INFORMATION AND EDUCATION

Information and education are important aspects of the forest, fish, and wildlife management program. It is imperative that the public be informed of management decisions and programs. Efforts will be made to publicize programs and actions such as timber sales. Education efforts will be aimed at explaining the purposes behind natural resources management and broadening the general public's understanding of ecological relationships.

A thorough network of trails throughout Mansfield Hollow Lake area provides ample opportunity for self-guided interpretation as well as guided tours. The cooperation of the University of Connecticut's Natural Resources Department will be enlisted in order to provide students an opportunity to have input in preparing self-guided trails.

SECTION 7. PERSONNEL AND FUNDING REQUIREMENTS TO IMPLEMENT PLAN

The Connecticut Department of Environmental Protection, current leasee of Mansfield Hollow Lake implements the forestry, fish, and wild-life management programs. The Corps of Engineers inspects all management practices to monitor compliance with the lease agreement.

FOREST MANAGEMENT

Inspection of timber sales (annually):

| | |
|--|------------|
| 1 GS-07/09 Park Ranger For two weeks = | \$1,200.00 |
|--|------------|

WILDLIFE MANAGEMENT

Inspection of agricultural leases (annually):

| | |
|--|------------|
| 1 GS-07/09 Park Ranger For two weeks = | \$1,200.00 |
|--|------------|

APPENDIX I

PROCEDURAL GUIDELINES OF AGRICULTURAL AGREEMENTS

1. As current Real Estate leases between the Army Corps of Engineers and farmers expire, the State Wildlife Unit will implement the Cooperative Agricultural Agreement Program.
2. Renewal agreements will be executed for a period of five (5) years. Annual land use plans will be developed by the Wildlife Biologist.
3. Arrangements will be made by the Biologist for field review with the cooperating farmer. Amount of services to be performed for wildlife will be determined on an individual basis.
4. Agreement statement and Land Use Plan (including sketch map(s)) are completed and submitted to the D.E.P. Property Management Unit.
5. Supervising Land Agent executes records and submits copies to Lessee, D.E.P. District Office, Project Manager.
6. Project Manager receives records for Corps approval.
7. Work begins.
8. Inspections will be made twice annually by Wildlife Biologist to insure conformance with agreement prescriptions.

APPENDIX II

CURRENT MANSFIELD HOLLOW PROJECT

REAL ESTATE LEASES

| <u>Lessee</u> | <u>Tract #</u> | <u>Purpose</u> | <u>Acreage*</u> | <u>Term</u> |
|-----------------|-----------------------------|-----------------|-----------------|---------------------|
| Thomas Wells | 181,184 portions 176,183 | forage/hay/corn | 171.0 | 1 Apr 79- 1 Apr 84 |
| George Landeck | 106 | hay | 8.6 | 17 Aug 77- 6 Aug 82 |
| | 105,108 | hay | 85.0 | 1 Sep 78-31 Aug 83 |
| William Gerdson | 107 | forage/hay | 25.75 | 1 Jun 80-31 Oct 84 |
| Russell Martin | 45 | hay | 25.0 | 1 Jul 78-30 Jun 83 |
| Arthur Chovnick | 37,53,54 | agric/gard | 2.15 | 9 Sep 78- 8 Sep 83 |
| Carl DeBoer | 83 | Beautification | - | indefinite |
| Roger Lizée | 60 | " " | - | " |
| Russell Kearns | 68,69 | " " | - | " |
| Helen Newcomb | 56 | " " | - | " |
| Richard DeBoer | 18 | forage | 17.0 | 24 Nov 80-23 Nov 85 |

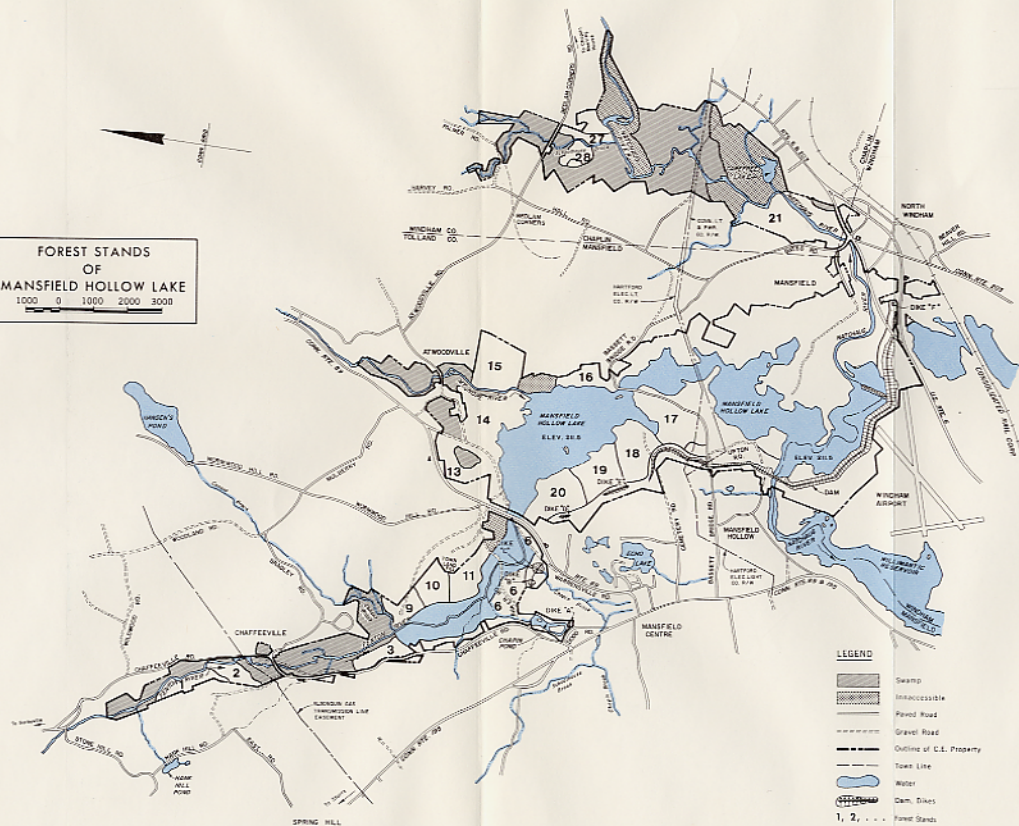
* Includes non-fillable land

FOREST MANAGEMENT PLAN
APPENDIX III
STAND TABLE

| | Acres | Stand Number | Type | Size Class | BASAL AREA AGS-UGS-CULL | Site Index | Stand Condition | Under-story | Operability | Volume Per Acre | Treatment Priority | Silvicultural Prescription | Comments |
|---------|-------|--------------|-------|------------|-------------------------------|------------------|----------------------|-------------|---------------|---|-----------------------|-------------------------------|--|
| | | | | | | | | | | | | | |
| A-III-1 | 29 | 6 | MH | sawtimber | AGSUGSCM TOTAL 46 26 16 88 | 55-60 | poor | open | good | 2500 oak 1000 hickory 1500 pine | | Shelterwood log cut | pine seed yr. |
| | 25 | 11 | MH | sawtimber | 34 28 18 80 | 54- | poor | open | good steep | 3000 oak 300 pine | | Shelterwood log cut | pine seed yr. |
| | 39 | 19 | MH | p-s | 34 18 10 62 | 54- | poor | moderate | good | 1500 oak 500 pine | | Shelterwood log cut | pine seed yr. |
| | 27 | 21 | MH | sawtimber | 15 25 40 80 | 54- | very poor | variable | good | | | Shelterwood fuelwood out | pine seed yr. |
| | 25 | 13-14 | MH | p-s | 40 35 35 110 | 54- | very poor | open | fair | | | Shelterwood fuelwood out | |
| | 20 | 5 | MH | p-s | 44 46 18 108 | 60-75 | poor | open | good steep | 3000 oak 750 pine | | Shelterwood log cut | |
| | 38 | 20 | SH | sawtimber | 62 20 24 106 | 54- for oak | crowded | moderate | good steep | 4500 pine 500 pine 700 oak | | Fuelwood thin | |
| | 48 | 18 | Pine | sawtimber | 72 20 22 114 | 55-60 for oak | crowded in clumps | moderate | good | 4000 pine 300 oak | | log thin | |
| | 18 | 17 | Pine | sawtimber | 74 22 2 98 | 55-60 for oak | ok | dense | good steep | 4500 pine | | leave alone | |
| | 7 | 27 | Pine | sawtimber | 104 38 26 168 | 54- for oak | crowded | open | good steep | 8000 2000 oak | | pine log thin | |
| | 7 | 28 | Pine | sawtimber | 104 40 22 166 | 55-60 for oak | crowded | open | good | 9000 pine | | log thin | possibly fund planting adj. fields |
| | 19 | 9 | OF/MH | p-s | 28 16 54 98 | 60-75 | poor | moderate | good | 1000 oak 500 pine | | shelterwood fuelwood cut | |
| | 50 | 15 | MH | sawtimber | 50 40 16 106 | 60-75 | fair | dense | good rocky | 4500 oak 1000 hickory 300 sugar maple | | shelterwood log cut | some hardwood mortality |
| | 27 | 2 | NH | sawtimber | 62 26 36 124 | 60-75 for oak | crowded | moderate | good net | 2500 sugar maple 2000 oak 500 hickory | | fuelwood thin | |
| | 15 | 1 | SH | p-s | 74 48 20 142 | 55-60 for oak | fair crowded | moderate | good | 2500 hemlock 1000 red maple 500 oak | | fuelwood thin | |
| | 22 | 16 | MH | p-s | 54 28 14 96 | 55-60 | crowded | open | good | 2500 oak 800 pine | | log thin | |

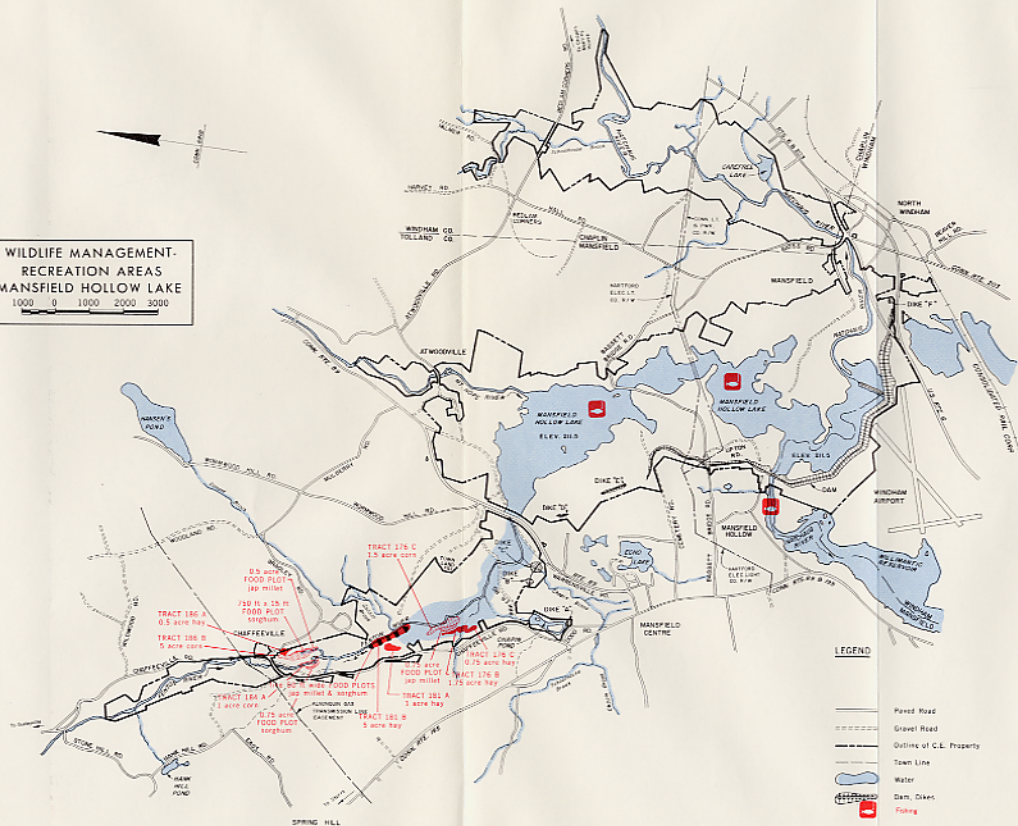
FOREST STANDS
OF
MANSFIELD HOLLOW LAKE

1000 0 1000 2000 3000








WILDLIFE MANAGEMENT-
RECREATION AREAS
MANSFIELD HOLLOW LAKE

1000 0 1000 2000 30



LEGEND

- | | |
|---|--------------------------|
|  | Paved Road |
|  | Gravel Road |
|  | Outline of C.E. Property |
|  | Town Line |
|  | Water |
|  | Dam, Dikes |
|  | Fishing |

A geological cross-section diagram showing stratigraphic units and structural features. The vertical axis on the left is labeled 'FEET' with a scale from 0 to 3000. The horizontal axis at the bottom is labeled 'MILES' with a scale from 0 to 3. The cross-section shows several geological units: a top layer of 'GRAVELLY SAND' (light gray), followed by 'SAND' (white), 'CLAY' (dark gray), and 'SAND' (white). A prominent 'FAULT' is shown as a diagonal line separating the units. Below the fault, there is a 'CLAY' unit (dark gray) and a 'SAND' unit (white). The bottom of the section is labeled 'SEA LEVEL'.

EXHIBIT B

MANSFIELD HOLLOW LAKE